Your specials are our standards.
당신의 스페셜은 우리의 표준품입니다.

제이제이툴스(주)
JJ TOOLS Co.,Ltd.
(구) 장진공구

LOW Price HIGH Performance

경사진 표면 및 곡면 가공을 위한 FLAT 디자인 적용!

Applied flat design for inclined or curved surfaces when counter boring and drilling

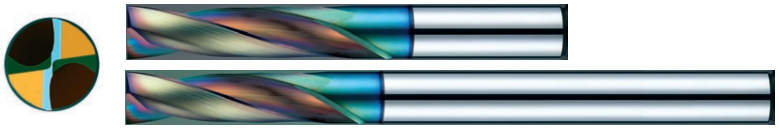
NEW

가격만족, 성능만족 - 다기능 플랫드릴 시리즈

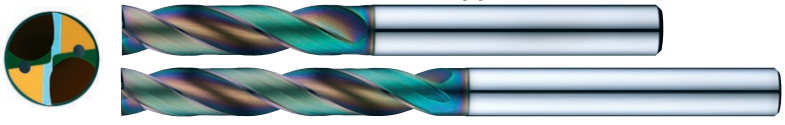
FLAT DRILL

Price Satisfaction, performance Satisfaction - Multi functional Flat Drill Series

헬릭스 20°, 뛰어난 칩 배출력!
Helix 20°, Excellnet chip emission !



헬릭스 25~30° 오일 홀 타입 적용!
Helix 25~30, Coolant hole type !



카운터 보링 및 드릴링 작업의 혁신 !

Innovation of Counter Boring and Drilling !

180도 평면의 날부 설계 !

Designed 180˚ flat cutting edge !

다양한 피삭재의 가공표면을 절삭 가능하게 합니다.
Enable surface machining to a variety of materials.

균일한 카운터 보링 및 드릴링의 실현 !

Uniform counter boring and drilling are available !

샤프트한 게쉬값을 flat 드릴에 설계하여, 짧고 균일한 절삭칩을 형성합니다.
Sharp gash designed for uiformity and short chip emission on the flat drill.

더욱 효율적으로 개선된 인선부 !

Improved flute design to be used more effectively !

실드 엣지를 채택하여 flat 드릴 끝날의 급각 파손을 방지 하였습니다.
Designed shield edge on flat drill to minimizing dramatic cutting flute breakage.

칩배출이 용이한 넓은 칩 포켓 !

Wide chip pocket for excellent chip emission !

절삭 칩이 원활하게 배출됩니다.
Cutting chip are smoothly evacuated.

새로운 TISIN-R 코팅을 적용 !

Applied new TISIN-R coating !

TISIN-R 코팅을 적용하여 내마모성을 높였으며, 드릴 인선부의 구성인선을 (built -up edge)를 억제하여 초기 flat 드릴 마모를 대폭 개선하였습니다.

Reinforced coating properties and restrained built-up edge to enhance wear resistance of flat drill.

항절력이 높은 초경소재 적용 !

Applied high TRS fine WC grade !

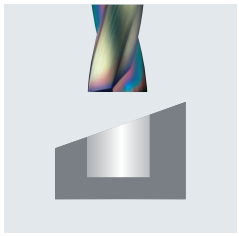
flat 드릴의 사용 시 초경공구의 부러짐 현상을 최소화 하였습니다.
Minimized sudden tool breakage when using the flat drill.

하나의 드릴로 다양한 가공 가능!

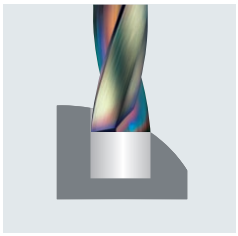
Multiple processing is available with one drill !

기존에는 엔드밀과 드릴을 같이 사용하여 번거로웠으나, 플랫드릴은 원스텝 가공으로 시간과 공구 관리를 단순화 시켰습니다.

Compared to traditional way, which uses end mill and drill separately, Flat drill as one-step processing simplifies short machining time and tool management.

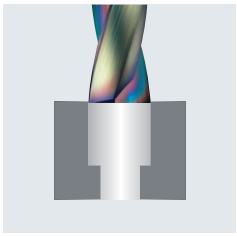


경사진 표면
Inclined surface

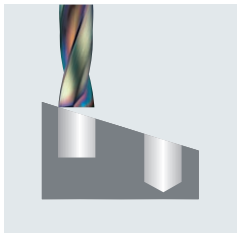


곡면에 카운터링
Countering in curved surface

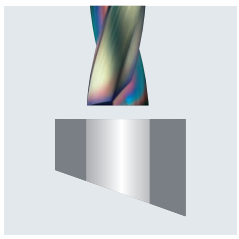
복잡한 자리에 카운터 보링
Counterboring in intricate position



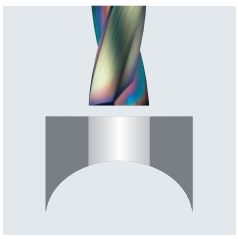
카운터 보링
CounterboringGuide hole



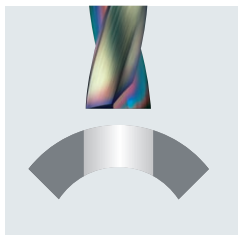
가이드 홀



경사진 출사면
Inclined exit surface

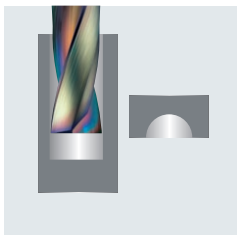


곡선의 출사면
Curved exit surface

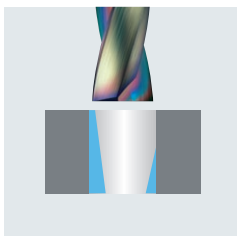


곡면에 관통 홀
Through hole in curved surface

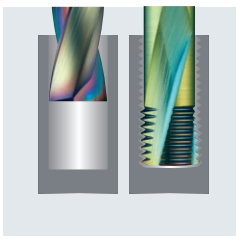
얇은 판
Thin plate



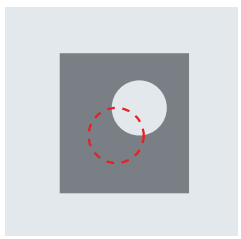
반 홀
Half-hole



특이한 홀의 교정
Correction of eccentric hole



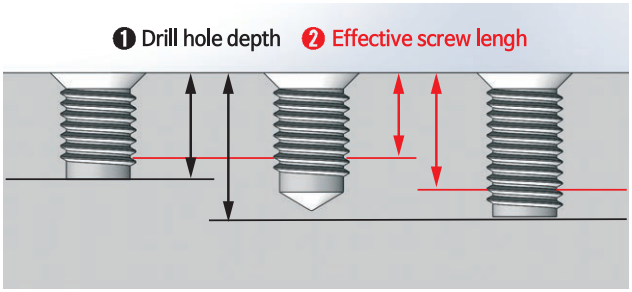
관통되지 않은 홀에 쓰레딩
Blind hole for threading



겹쳐진 홀
Overlapped holes

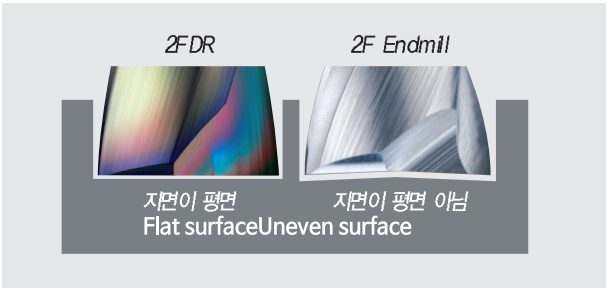
각도 드릴보다 효과적인 드릴링

More effective drilling than angle drill



한번의 드릴링으로 완전 평면 구현

Complete flat surface machining is available with one drilling

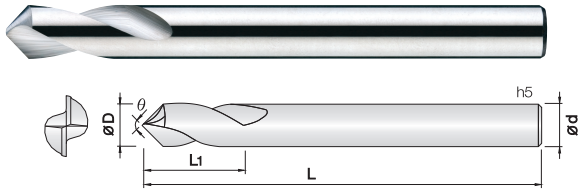


❶ 드릴 홀의 깊이가 기존 드릴 홀의 깊이보다 짧게 위치합니다.
Drill hole depth can be shorter than the conventional drill hole depth.

❷ 드릴 홀의 깊이가 기존 드릴 홀의 깊이에서 유효 나사길이가 길어집니다.
Drill hole depth can be deeper than the conventional screw depth.

2SPO

Carbide 2 Flutes NC Spotting Drill
초경2날 NC 스포팅 드릴



- HRc50이하의 고경도강, 프리하든강, 공구강, 주철 등 피삭재 가공
- 실리콘계 코팅(Si) 처리하여 내마모성이 우수합니다.
- 헬릭스 타입 2날을 적용하여 센터링 작업에 적합합니다.
- 코팅과 비코팅으로 구분하여 수지, 아크릴 등의 가공도 가능합니다.
- 미립자 초경합금을 채택하여 다양한 비철합금 및 목업의 피삭재 영역에 적용 가능합니다.

- Drills for various work materials, hardened steel, prehardened steel, tool steel and cast iron.
- Good wear resistance by Si-based PVD coating.
- Optimum for centering with helix 2flutes.
- Resin, plastic machining applicable witn coated or non coated endmill.
- Applied fine WC grade optimized for various non-ferrous and non-metallic work materials.

2 | WC 미립자 | TISIN Coating | D +0-0.01 Ø0.3~4 | D -0.01-0.025 Ø6~12 | D -0.015-0.03 Ø16 | 30° Helix Angle | CUTTING DATA 379P

D Size	D Tolerance
Ø0.3 ~ 4	+0 ~ -0.012mm
Ø6 ~ 12	-0.01 ~ -0.025mm
Ø16	-0.015 ~ -0.03mm

단위: mm

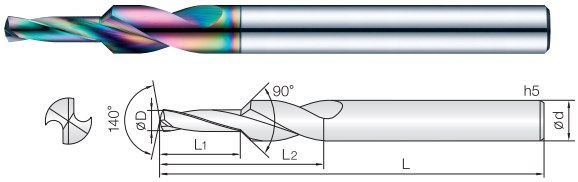
Order Number 비코팅 Un coated	Order Number 코팅 Coated	날경 Diameter D	각도 Angle θ	날장 Length of cut L1	전장 Overall Length L	생크 Shank Dia d	비고 비코팅 Un coated	비고 코팅 Coated
2SPO 003 090 040	2SPOC 003 090 040	0.3	90°	0.9	40	3		
2SPO 005 090 040	2SPOC 005 090 040	0.5	90°	1.5	40	3		
2SPO 008 090 040	2SPOC 008 090 040	0.8	90°	2.4	40	3		
2SPO 010 090 050	2SPOC 010 090 050	1	90°	3	50	3		
	2SPOC 010 090 080	1	90°	3	80	3		
2SPO 010 120 050	2SPOC 010 120 050	1	120°	3	50	3		
2SPO 015 090 050	2SPOC 015 090 050	1.5	90°	4.5	50	3		
2SPO 020 090 050	2SPOC 020 090 050	2	90°	6	50	3		
	2SPOC 020 090 080	2	90°	6	80	3		
2SPO 020 120 050	2SPOC 020 120 050	2	120°	6	50	3		
2SPO 030 090 050	2SPOC 030 090 050	3	90°	10	50	3		
2SPO 030 120 050	2SPOC 030 120 050	3	120°	10	50	3		
2SPO 030 090 100	2SPOC 030 090 100	3	90°	10	100	3		
2SPO 030 120 100	2SPOC 030 120 100	3	120°	10	100	3		
2SPO 040 090 050	2SPOC 040 090 050	4	90°	12	50	4		
2SPO 040 120 050	2SPOC 040 120 050	4	120°	12	50	4		
2SPO 040 090 100	2SPOC 040 090 100	4	90°	12	100	4		
2SPO 040 120 100	2SPOC 040 120 100	4	120°	12	100	4		
2SPO 060 090 070	2SPOC 060 090 070	6	90°	15	70	6		
2SPO 060 120 070	2SPOC 060 120 070	6	120°	15	70	6		
2SPO 060 090 110	2SPOC 060 090 110	6	90°	15	110	6		
	2SPOC 060 090 150	6	90°	15	150	6		
2SPO 060 120 110	2SPOC 060 120 110	6	120°	15	110	6		
2SPO 080 090 080	2SPOC 080 090 080	8	90°	25	80	8		
	2SPOC 080 090 150	8	90°	25	150	8		
2SPO 080 120 080	2SPOC 080 120 080	8	120°	25	80	8		
2SPO 100 090 090	2SPOC 100 090 090	10	90°	25	90	10		
2SPO 100 120 090	2SPOC 100 120 090	10	120°	25	90	10		
2SPO 100 090 150	2SPOC 100 090 150	10	90°	25	150	10		
2SPO 100 120 150	2SPOC 100 120 150	10	120°	25	150	10		
2SPO 120 090 090	2SPOC 120 090 090	12	90°	30	90	12		
2SPO 120 120 090	2SPOC 120 120 090	12	120°	30	90	12		
2SPO 120 090 150	2SPOC 120 090 150	12	90°	30	150	12		
2SPO 120 120 150	2SPOC 120 120 150	12	120°	30	150	12		
2SPO 160 090 110	2SPOC 160 090 110	16	90°	35	110	16		
2SPO 160 120 110	2SPOC 160 120 110	16	120°	35	110	16		

2STD

Carbide 2 Flutes Step Drill

초경 2날 스텝 드릴

New



- **프리하든강, 일반강, 주물, 비철합금 가공 드릴**
- 드릴링 작업과 면취작업을 동시에 가공할 수 있는 다기능 드릴입니다.
- TISIN-R 코팅 처리하여 다양한 피삭재 가공시 인선부에 스트레스가 적으며 피삭재의 면조도가 향상됩니다
- 다양한 피삭재 영역에 적용이 가능합니다.

- **Drills for pre-hardened steel, general steel, cast iron and non-ferrous alloy.**
- A multi-function drill that allows you to process both drilling and chamfering.
- TISIN-R coating reduces stress on the edge and improves the surface of roughness of the workpiece.
- It can be applied to various of workpieces.

2 | WC 미립자 | R TISIN-R | 140 | 18° Helix Angle | CUTTING DATA

379P

D Size	D Tolerance
Ø 3.4 ~ 5.1	+0 ~ -0.02mm
Ø 6.9 ~ 10.3	+0 ~ -0.025mm

단위: mm

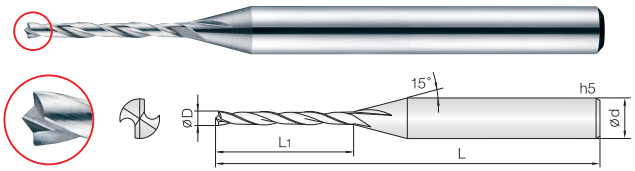
Order Number	날경 Diameter D	텝 TAP	날장 Length of cut L1	홈길이 Flute Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2STD 034 080 S06	3.4	M4	8	22	75	6	
2STD 034 120 S06	3.4	M4	12	27	75	6	
2STD 043 100 S08	4.3	M5	10	25	80	8	
2STD 043 150 S08	4.3	M5	15	30	80	8	
2STD 051 120 S08	5.1	M6	12	30	90	8	
2STD 051 180 S08	5.1	M6	18	35	90	8	
2STD 069 160 S10	6.9	M8	16	40	90	10	
2STD 069 240 S10	6.9	M8	24	45	100	10	
2STD 086 200 S12	8.6	M10	20	45	110	12	
2STD 086 300 S12	8.6	M10	30	55	120	12	
2STD 103 240 S14	10.3	M12	24	50	110	14	
2STD 103 360 S14	10.3	M12	36	60	120	14	

Order Number	날경 Diameter D	텝 TAP	날장 Length of cut L1	홈길이 Flute Length L2	전장 Overall Length L	생크 Shank Dia d	비고

2DED

Carbide 2 Flutes Deburring Micro Drill
초경 2날 디버링 마이크로 드릴

New



- **알루미늄, 구리, 비철합금, A.B.S수지, 레진 가공 드릴**
- 버를 최소화하기 위한 스페셜한 드릴 헤드 형상을 설계하였습니다.
- 드릴링 작업시 피삭재 센터의 드릴링 워킹 현상을 방지하여 정확한 드릴링 위치와 홀 크기를 제공합니다.

- **Drill for aluminium, copper, non-ferrous alloys, A.B.S and resin.**
- Special drill head geometry designed to minimize burrs.
- The drill location and hole size are provided to prevent drill walking in the center of the workpiece during drilling.

2 | WC 미립자 | 90 | 25° Helix Angle | CUTTING DATA

379P

D Size	D Tolerance
Ø 0.15 ~ 0.2	+0 ~ -0.005mm
Ø 0.21 ~ 3	+0 ~ -0.01mm
Ø 3.5 ~ 6	+0 ~ -0.015mm

단위: mm

Order Number	날경 Diameter D	날장 Length of cut L1	전장 Overall Length L	생크 Shank Dia d	비고
2DED 0015 009 S03	0.15	0.9	40	3	
2DED 0015 018 S03	0.15	1.8	40	3	
2DED 0016 009 S03	0.16	0.9	40	3	
2DED 0016 018 S03	0.16	1.8	40	3	
2DED 0017 009 S03	0.17	0.9	40	3	
2DED 0017 018 S03	0.17	1.8	40	3	
2DED 0018 0105 S03	0.18	1.05	40	3	
2DED 0018 021 S03	0.18	2.1	40	3	
2DED 0019 0105 S03	0.19	1.05	40	3	
2DED 0019 021 S03	0.19	2.1	40	3	
2DED 002 012 S03	0.2	1.2	40	3	
2DED 002 024 S03	0.2	2.4	40	3	
2DED 0021 012 S03	0.21	1.2	40	3	
2DED 0021 024 S03	0.21	2.4	40	3	
2DED 0022 013 S03	0.22	1.3	40	3	
2DED 0022 026 S03	0.22	2.6	40	3	
2DED 0023 013 S03	0.23	1.3	40	3	
2DED 0023 026 S03	0.23	2.6	40	3	
2DED 0024 013 S03	0.24	1.3	40	3	
2DED 0024 026 S03	0.24	2.6	40	3	
2DED 0025 015 S03	0.25	1.5	40	3	
2DED 0025 030 S03	0.25	3	40	3	
2DED 0026 015 S03	0.26	1.5	40	3	
2DED 0026 030 S03	0.26	3	40	3	
2DED 0027 015 S03	0.27	1.5	40	3	
2DED 0027 030 S03	0.27	3	40	3	
2DED 0028 0165 S03	0.28	1.65	40	3	
2DED 0028 033 S03	0.28	3.3	40	3	
2DED 0029 0165 S03	0.29	1.65	40	3	
2DED 0029 033 S03	0.29	3.3	40	3	
2DED 003 025 S03	0.3	2.5	40	3	
2DED 003 050 S03	0.3	5	40	3	
2DED 0035 025 S03	0.35	2.5	40	3	
2DED 0035 050 S03	0.35	5	40	3	
2DED 004 030 S03	0.4	3	40	3	
2DED 004 060 S03	0.4	6	40	3	
2DED 0045 030 S03	0.45	3	40	3	
2DED 0045 060 S03	0.45	6	40	3	
2DED 005 030 S03	0.5	3	40	3	
2DED 005 060 S03	0.5	6	40	3	
2DED 0055 030 S03	0.55	3	40	3	
2DED 0055 060 S03	0.55	6	40	3	
2DED 006 035 S03	0.6	3.5	40	3	
2DED 006 070 S03	0.6	7	40	3	
2DED 0065 035 S03	0.65	3.5	40	3	
2DED 0065 070 S03	0.65	7	40	3	
2DED 007 040 S03	0.7	4	40	3	
2DED 007 080 S03	0.7	8	40	3	
2DED 0075 040 S03	0.75	4	40	3	
2DED 0075 080 S03	0.75	8	40	3	

Order Number	날경 Diameter D	날장 Length of cut L1	전장 Overall Length L	생크 Shank Dia d	비고
2DED 008 040 S03	0.8	4	40	3	
2DED 008 080 S03	0.8	8	40	3	
2DED 0085 040 S03	0.85	4	40	3	
2DED 0085 080 S03	0.85	8	40	3	
2DED 009 040 S03	0.9	4	40	3	
2DED 009 080 S03	0.9	8	40	3	
2DED 0095 040 S03	0.95	4	40	3	
2DED 0095 080 S03	0.95	8	40	3	
2DED 010 050 S03	1	5	40	3	
2DED 010 100 S03	1	10	40	3	
2DED 011 050 S03	1.1	5	40	3	
2DED 011 100 S03	1.1	10	40	3	
2DED 012 050 S03	1.2	5	40	3	
2DED 012 100 S03	1.2	10	40	3	
2DED 013 050 S03	1.3	5	40	3	
2DED 013 100 S03	1.3	10	40	3	
2DED 014 050 S03	1.4	5	40	3	
2DED 014 100 S03	1.4	10	40	3	
2DED 015 075 S03	1.5	7.5	45	3	
2DED 015 150 S03	1.5	15	45	3	
2DED 016 075 S03	1.6	7.5	45	3	
2DED 016 150 S03	1.6	15	45	3	
2DED 017 075 S03	1.7	7.5	45	3	
2DED 017 150 S03	1.7	15	45	3	
2DED 018 075 S03	1.8	7.5	45	3	
2DED 018 150 S03	1.8	15	45	3	
2DED 019 075 S03	1.9	7.5	45	3	
2DED 019 150 S03	1.9	15	45	3	
2DED 020 110 S03	2	11	50	3	
2DED 020 220 S03	2	22	50	3	
2DED 021 110 S03	2.1	11	50	3	
2DED 021 220 S03	2.1	22	50	3	
2DED 022 110 S03	2.2	11	50	3	
2DED 022 220 S03	2.2	22	50	3	
2DED 023 110 S03	2.3	11	50	3	
2DED 023 220 S03	2.3	22	50	3	
2DED 024 110 S03	2.4	11	50	3	
2DED 024 220 S03	2.4	22	50	3	
2DED 025 110 S03	2.5	11	50	3	
2DED 025 220 S03	2.5	22	50	3	
2DED 026 110 S03	2.6	11	50	3	
2DED 026 220 S03	2.6	22	50	3	
2DED 027 125 S03	2.7	12.5	50	3	
2DED 027 250 S03	2.7	25	50	3	
2DED 028 125 S03	2.8	12.5	50	3	
2DED 028 250 S03	2.8	25	50	3	
2DED 029 125 S03	2.9	12.5	50	3	
2DED 029 250 S03	2.9	25	50	3	
2DED 030 125 S03	3	12.5	50	3	
2DED 030 250 S03	3	25	50	3	

단위: mm

Order Number	날경 Diameter D	날장 Length of cut L1	전장 Overall Length L	생크 Shank Dia d	비고
2DED 035 175 S04	3.5	17.5	75	4	
2DED 035 350 S04	3.5	35	75	4	
2DED 040 200 S04	4	20	85	4	
2DED 040 400 S04	4	40	85	4	
2DED 045 210 S06	4.5	21	85	6	
2DED 045 420 S06	4.5	42	85	6	
2DED 050 225 S06	5	22.5	90	6	
2DED 050 450 S06	5	45	90	6	
2DED 055 225 S06	5.5	22.5	95	6	
2DED 055 450 S06	5.5	45	95	6	
2DED 060 250 S06	6	25	100	6	
2DED 060 500 S06	6	50	100	6	

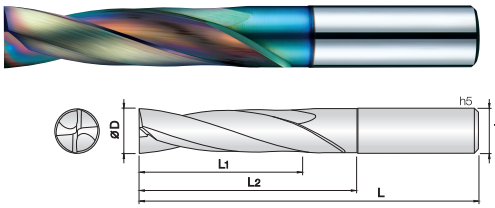
Order Number	날경 Diameter D	날장 Length of cut L1	전장 Overall Length L	생크 Shank Dia d	비고

2FDR

Carbide 2 Flutes, Multi-Processing Flat Drill

초경 2날/ 다기능 플랫 드릴

New



- **HRC50이하, 프리하든강, 합금강, 주철, 알루미늄 가공용 플랫 드릴**
- 밑날 플랫타입으로 다양한 경사면과 곡면 드릴가공에 탁월한 성능을 발휘합니다.
- 20도 헬릭스를 채택하여 칩배출 성능이 매우 우수합니다.
- 관통 드릴 작업시 버 발생을 최소화 합니다.
- TISIN-R 코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.

- **Flat drill for material below HRc 50, pre-hardened steel, alloy steel, cast iron and aluminum.**
- With flat type of end face, excellent performance drilling is available to a variety of inclined and curved surfaces.
- Chip emission is great and stable drilling is available with 20 degree helix design.
- Minimize burrs during penetration drilling.
- Increased tool life by applying TISIN-R coating with great heat and wear resistance.

2 | WC 미립자 | R TISIN-R | h7 Tolerence | 20° Helix Angle | CUTTING DATA

380P

단위: mm

Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDR 002 009 S03	0.2	0.8	0.9	50	3	
2FDR 0025 011 S03	0.25	1	1.1	50	3	
2FDR 003 013 S03	0.3	1.2	1.3	50	3	
2FDR 0035 015 S03	0.35	1.4	1.5	50	3	
2FDR 004 017 S03	0.4	1.6	1.7	50	3	
2FDR 0045 019 S03	0.45	1.8	1.9	50	3	
2FDR 005 022 S03	0.5	2	2.2	50	3	
2FDR 0055 024 S03	0.55	2.2	2.4	50	3	
2FDR 006 026 S03	0.6	2.4	2.6	50	3	
2FDR 0065 028 S03	0.65	2.6	2.8	50	3	
2FDR 007 030 S03	0.7	2.8	3	50	3	
2FDR 0075 032 S03	0.75	3	3.2	50	3	
2FDR 008 034 S03	0.8	3.2	3.4	50	3	
2FDR 0085 037 S03	0.85	3.4	3.7	50	3	
2FDR 009 039 S03	0.9	3.6	3.9	50	3	
2FDR 0095 041 S03	0.95	3.8	4.1	50	3	
2FDR 010 043 S03	1	4	4.3	50	3	
2FDR 011 047 S03	1.1	4.4	4.7	50	3	
2FDR 012 052 S03	1.2	4.8	5.2	50	3	
2FDR 013 056 S03	1.3	5.2	5.6	50	3	
2FDR 014 060 S03	1.4	5.6	6	50	3	
2FDR 015 065 S03	1.5	6	6.5	50	3	
2FDR 016 069 S03	1.6	6.4	6.9	50	3	
2FDR 017 073 S03	1.7	6.8	7.3	50	3	
2FDR 018 077 S03	1.8	7.2	7.7	50	3	
2FDR 019 082 S03	1.9	7.6	8.2	50	3	
2FDR 020 086 S04	2	8	8.6	50	4	
2FDR 021 090 S04	2.1	8.4	9	50	4	
2FDR 022 095 S04	2.2	8.8	9.5	50	4	
2FDR 023 099 S04	2.3	9.2	9.9	50	4	
2FDR 024 103 S04	2.4	9.6	10.3	50	4	
2FDR 025 108 S04	2.5	10	10.8	50	4	
2FDR 026 112 S04	2.6	10.4	11.2	50	4	
2FDR 027 116 S04	2.7	10.8	11.6	50	4	
2FDR 028 120 S04	2.8	11.2	12	50	4	
2FDR 029 125 S04	2.9	11.6	12.5	50	4	
2FDR 030 129 S06	3	12	12.9	50	6	
2FDR 031 133 S06	3.1	12.4	13.3	50	6	
2FDR 032 138 S06	3.2	12.8	13.8	50	6	
2FDR 033 142 S06	3.3	13.2	14.2	50	6	
2FDR 034 146 S06	3.4	13.6	14.6	50	6	
2FDR 035 151 S06	3.5	14	15.1	50	6	
2FDR 036 155 S06	3.6	14.4	15.5	50	6	
2FDR 037 159 S06	3.7	14.8	15.9	50	6	
2FDR 038 163 S06	3.8	15.2	16.3	50	6	
2FDR 039 168 S06	3.9	15.6	16.8	50	6	
2FDR 040 172 S06	4	16	17.2	50	6	
2FDR 041 176 S06	4.1	16.4	17.6	60	6	
2FDR 042 181 S06	4.2	16.8	18.1	60	6	
2FDR 043 185 S06	4.3	17.2	18.5	60	6	

Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDR 044 189 S06	4.4	17.6	18.9	60	6	
2FDR 045 194 S06	4.5	18	19.4	60	6	
2FDR 046 198 S06	4.6	18.4	19.8	60	6	
2FDR 047 202 S06	4.7	18.8	20.2	60	6	
2FDR 048 206 S06	4.8	19.2	20.6	60	6	
2FDR 049 211 S06	4.9	19.6	21.1	60	6	
2FDR 050 215 S06	5	20	21.5	60	6	
2FDR 051 219 S06	5.1	20.4	21.9	60	6	
2FDR 052 224 S06	5.2	20.8	22.4	60	6	
2FDR 053 228 S06	5.3	21.2	22.8	60	6	
2FDR 054 232 S06	5.4	21.6	23.2	60	6	
2FDR 055 237 S06	5.5	22	23.7	60	6	
2FDR 056 241 S06	5.6	22.4	24.1	60	6	
2FDR 057 245 S06	5.7	22.8	24.5	60	6	
2FDR 058 249 S06	5.8	23.2	24.9	60	6	
2FDR 059 254 S06	5.9	23.6	25.4	60	6	
2FDR 060 258 S06	6	24	25.8	60	6	
2FDR 061 262 S08	6.1	24.4	26.2	70	8	
2FDR 062 267 S08	6.2	24.8	26.7	70	8	
2FDR 063 271 S08	6.3	25.2	27.1	70	8	
2FDR 064 275 S08	6.4	25.6	27.5	70	8	
2FDR 065 280 S08	6.5	26	28	70	8	
2FDR 066 284 S08	6.6	26.4	28.4	70	8	
2FDR 067 288 S08	6.7	26.8	28.8	70	8	
2FDR 068 292 S08	6.8	27.2	29.2	70	8	
2FDR 069 297 S08	6.9	27.6	29.7	70	8	
2FDR 070 301 S08	7	28	30.1	70	8	
2FDR 071 305 S08	7.1	28.4	30.5	70	8	
2FDR 072 310 S08	7.2	28.8	31	70	8	
2FDR 073 314 S08	7.3	29.2	31.4	70	8	
2FDR 074 318 S08	7.4	29.6	31.8	70	8	
2FDR 075 323 S08	7.5	30	32.3	70	8	
2FDR 076 327 S08	7.6	30.4	32.7	70	8	
2FDR 077 331 S08	7.7	30.8	33.1	70	8	
2FDR 078 335 S08	7.8	31.2	33.5	70	8	
2FDR 079 340 S08	7.9	31.6	34	70	8	
2FDR 080 344 S08	8	32	34.4	70	8	
2FDR 081 348 S10	8.1	32.4	34.8	80	10	
2FDR 082 353 S10	8.2	32.8	35.3	80	10	
2FDR 083 357 S10	8.3	33.2	35.7	80	10	
2FDR 084 361 S10	8.4	33.6	36.1	80	10	
2FDR 085 366 S10	8.5	34	36.6	80	10	
2FDR 086 370 S10	8.6	34.4	37	80	10	
2FDR 087 374 S10	8.7	34.8	37.4	80	10	
2FDR 088 378 S10	8.8	35.2	37.8	80	10	
2FDR 089 383 S10	8.9	35.6	38.3	80	10	
2FDR 090 387 S10	9	36	38.7	80	10	
2FDR 091 391 S10	9.1	36.4	39.1	80	10	
2FDR 092 396 S10	9.2	36.8	39.6	80	10	
2FDR 093 400 S10	9.3	37.2	40	80	10	

단위: mm

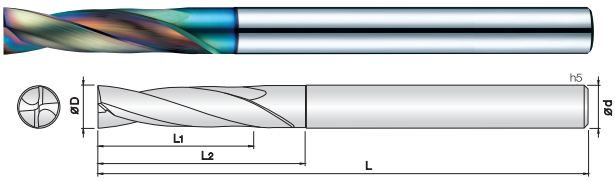
Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDR 094 404 S10	9.4	37.6	40.4	80	10	
2FDR 095 409 S10	9.5	38	40.9	80	10	
2FDR 096 413 S10	9.6	38.4	41.3	80	10	
2FDR 097 417 S10	9.7	38.8	41.7	80	10	
2FDR 098 421 S10	9.8	39.2	42.1	80	10	
2FDR 099 426 S10	9.9	39.6	42.6	80	10	
2FDR 100 430 S10	10	40	43	80	10	
2FDR 101 434 S12	10.1	40.4	43.4	90	12	
2FDR 102 439 S12	10.2	40.8	43.9	90	12	
2FDR 103 443 S12	10.3	41.2	44.3	90	12	
2FDR 104 447 S12	10.4	41.6	44.7	90	12	
2FDR 105 452 S12	10.5	42	45.2	90	12	
2FDR 106 456 S12	10.6	42.4	45.6	90	12	
2FDR 107 460 S12	10.7	42.8	46	90	12	
2FDR 108 464 S12	10.8	43.2	46.4	90	12	
2FDR 109 469 S12	10.9	43.6	46.9	90	12	
2FDR 110 473 S12	11	44	47.3	90	12	
2FDR 111 477 S12	11.1	44.4	47.7	90	12	
2FDR 112 482 S12	11.2	44.8	48.2	90	12	
2FDR 113 486 S12	11.3	45.2	48.6	90	12	
2FDR 114 490 S12	11.4	45.6	49	90	12	
2FDR 115 495 S12	11.5	46	49.5	90	12	
2FDR 116 499 S12	11.6	46.4	49.9	90	12	
2FDR 117 503 S12	11.7	46.8	50.3	90	12	
2FDR 118 507 S12	11.8	47.2	50.7	90	12	
2FDR 119 512 S12	11.9	47.6	51.2	90	12	
2FDR 120 516 S12	12	48	51.6	90	12	
2FDR 121 520 S14	12.1	48.4	52	100	14	
2FDR 122 525 S14	12.2	48.8	52.5	100	14	
2FDR 123 529 S14	12.3	49.2	52.9	100	14	
2FDR 124 533 S14	12.4	49.6	53.3	100	14	
2FDR 125 538 S14	12.5	50	53.8	100	14	
2FDR 126 542 S14	12.6	50.4	54.2	100	14	
2FDR 127 546 S14	12.7	50.8	54.6	100	14	
2FDR 128 550 S14	12.8	51.2	55	100	14	
2FDR 129 555 S14	12.9	51.6	55.5	100	14	
2FDR 130 559 S14	13	52	55.9	100	14	
2FDR 131 563 S14	13.1	52.4	56.3	100	14	
2FDR 132 568 S14	13.2	52.8	56.8	100	14	
2FDR 133 572 S14	13.3	53.2	57.2	100	14	
2FDR 134 576 S14	13.4	53.6	57.6	100	14	
2FDR 135 581 S14	13.5	54	58.1	100	14	
2FDR 136 585 S14	13.6	54.4	58.5	100	14	
2FDR 137 589 S14	13.7	54.8	58.9	100	14	
2FDR 138 593 S14	13.8	55.2	59.3	100	14	
2FDR 139 598 S14	13.9	55.6	59.8	100	14	
2FDR 140 602 S14	14	56	60.2	100	14	
2FDR 141 606 S16	14.1	56.4	60.6	105	16	
2FDR 142 611 S16	14.2	56.8	61.1	105	16	
2FDR 143 615 S16	14.3	57.2	61.5	105	16	
2FDR 144 619 S16	14.4	57.6	61.9	105	16	
2FDR 145 624 S16	14.5	58	62.4	105	16	
2FDR 146 628 S16	14.6	58.4	62.8	105	16	
2FDR 147 632 S16	14.7	58.8	63.2	105	16	
2FDR 148 636 S16	14.8	59.2	63.6	105	16	
2FDR 149 641 S16	14.9	59.6	64.1	105	16	
2FDR 150 645 S16	15	60	64.5	105	16	
2FDR 151 649 S16	15.1	60.4	64.9	115	16	
2FDR 152 654 S16	15.2	60.8	65.4	115	16	
2FDR 153 658 S16	15.3	61.2	65.8	115	16	
2FDR 154 662 S16	15.4	61.6	66.2	115	16	
2FDR 155 667 S16	15.5	62	66.7	115	16	
2FDR 156 671 S16	15.6	62.4	67.1	115	16	
2FDR 157 675 S16	15.7	62.8	67.5	115	16	
2FDR 158 679 S16	15.8	63.2	67.9	115	16	
2FDR 159 684 S16	15.9	63.6	68.4	115	16	
2FDR 160 688 S16	16	64	68.8	115	16	
2FDR 165 710 S18	16.5	66	71	125	18	
2FDR 170 731 S18	17	68	73.1	125	18	
2FDR 175 753 S18	17.5	70	75.3	125	18	
2FDR 180 774 S18	18	72	77.4	125	18	
2FDR 185 796 S20	18.5	74	79.6	135	20	
2FDR 190 817 S20	19	76	81.7	135	20	
2FDR 195 839 S20	19.5	78	83.9	145	20	
2FDR 200 860 S20	20	80	86	145	20	

2FDRL

Carbide 2 Flutes, Multi-Processing Flat Drill with Long Shank

초경 2날/ 롱생크 다기능 플랫 드릴

New



- **HRC50이하, 프리하든강, 합금강, 주철, 알루미늄 가공용 플랫 드릴**
- 밑날 플랫타입으로 다양한 경사면과 곡면 드릴가공에 탁월한 성능을 발휘합니다.
- 20도 헬릭스를 채택하여 칩배출 성능이 매우 우수합니다.
- 관통 드릴 작업시 버 발생을 최소화 합니다.
- TISIN-R 코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.

- **Flat drill for material below HRc 50, pre-hardened steel, alloy steel, cast iron and aluminum.**
- With flat type of end face, excellent performance drilling is available to a variety of inclined and curved surfaces.
- Chip emission is great and stable drilling is available with 20 degree helix design.
- Minimize burrs during penetration drilling.
- Increased tool life by applying TISIN-R coating with great heat and wear resistance.

2 | WC 미립자 | R TISIN-R | h7 Tolerence | 20° Helix Angle | CUTTING DATA

380P

단위: mm

Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDRL 030 300 S06	3	12	30	100	6	
2FDRL 031 310 S06	3.1	12.4	31	100	6	
2FDRL 032 320 S06	3.2	12.8	32	100	6	
2FDRL 033 330 S06	3.3	13.2	33	100	6	
2FDRL 034 340 S06	3.4	13.6	34	100	6	
2FDRL 035 350 S06	3.5	14	35	100	6	
2FDRL 036 360 S06	3.6	14.4	36	100	6	
2FDRL 037 370 S06	3.7	14.8	37	100	6	
2FDRL 038 380 S06	3.8	15.2	38	100	6	
2FDRL 039 390 S06	3.9	15.6	39	100	6	
2FDRL 040 400 S06	4	16	40	100	6	
2FDRL 041 410 S06	4.1	16.4	41	100	6	
2FDRL 042 420 S06	4.2	16.8	42	100	6	
2FDRL 043 430 S06	4.3	17.2	43	100	6	
2FDRL 044 440 S06	4.4	17.6	44	100	6	
2FDRL 045 450 S06	4.5	18	45	100	6	
2FDRL 046 460 S06	4.6	18.4	46	100	6	
2FDRL 047 470 S06	4.7	18.8	47	100	6	
2FDRL 048 480 S06	4.8	19.2	48	100	6	
2FDRL 049 490 S06	4.9	19.6	49	100	6	
2FDRL 050 500 S06	5	20	50	100	6	
2FDRL 051 510 S06	5.1	20.4	51	110	6	
2FDRL 052 520 S06	5.2	20.8	52	110	6	
2FDRL 053 530 S06	5.3	21.2	53	110	6	
2FDRL 054 540 S06	5.4	21.6	54	110	6	
2FDRL 055 550 S06	5.5	22	55	110	6	
2FDRL 056 560 S06	5.6	22.4	56	110	6	
2FDRL 057 570 S06	5.7	22.8	57	110	6	
2FDRL 058 580 S06	5.8	23.2	58	110	6	
2FDRL 059 590 S06	5.9	23.6	59	110	6	
2FDRL 060 480 S06	6	24	48	110	6	
2FDRL 061 488 S08	6.1	24.4	48.8	120	8	
2FDRL 062 496 S08	6.2	24.8	49.6	120	8	
2FDRL 063 504 S08	6.3	25.2	50.4	120	8	
2FDRL 064 512 S08	6.4	25.6	51.2	120	8	
2FDRL 065 520 S08	6.5	26	52	120	8	
2FDRL 066 528 S08	6.6	26.4	52.8	120	8	
2FDRL 067 536 S08	6.7	26.8	53.6	120	8	
2FDRL 068 544 S08	6.8	27.2	54.4	120	8	
2FDRL 069 552 S08	6.9	27.6	55.2	120	8	
2FDRL 070 560 S08	7	28	56	120	8	
2FDRL 071 568 S08	7.1	28.4	56.8	120	8	
2FDRL 072 576 S08	7.2	28.8	57.6	120	8	
2FDRL 073 584 S08	7.3	29.2	58.4	120	8	
2FDRL 074 592 S08	7.4	29.6	59.2	120	8	
2FDRL 075 600 S08	7.5	30	60	120	8	
2FDRL 076 608 S08	7.6	30.4	60.8	120	8	
2FDRL 077 616 S08	7.7	30.8	61.6	120	8	
2FDRL 078 624 S08	7.8	31.2	62.4	120	8	
2FDRL 079 632 S08	7.9	31.6	63.2	120	8	
2FDRL 080 640 S08	8	32	64	120	8	
2FDRL 081 648 S10	8.1	32.4	64.8	130	10	
2FDRL 082 656 S10	8.2	32.8	65.6	130	10	
2FDRL 083 664 S10	8.3	33.2	66.4	130	10	

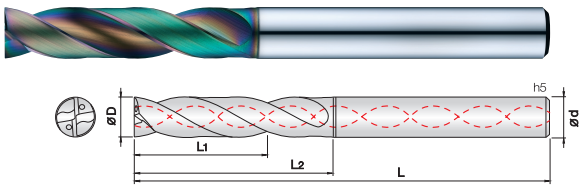
Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDRL 084 672 S10	8.4	33.6	67.2	130	10	
2FDRL 085 680 S10	8.5	34	68	130	10	
2FDRL 086 688 S10	8.6	34.4	68.8	130	10	
2FDRL 087 696 S10	8.7	34.8	69.6	130	10	
2FDRL 088 704 S10	8.8	35.2	70.4	130	10	
2FDRL 089 712 S10	8.9	35.6	71.2	130	10	
2FDRL 090 720 S10	9	36	72	130	10	
2FDRL 091 728 S10	9.1	36.4	72.8	130	10	
2FDRL 092 736 S10	9.2	36.8	73.6	130	10	
2FDRL 093 744 S10	9.3	37.2	74.4	130	10	
2FDRL 094 752 S10	9.4	37.6	75.2	130	10	
2FDRL 095 760 S10	9.5	38	76	130	10	
2FDRL 096 768 S10	9.6	38.4	76.8	130	10	
2FDRL 097 776 S10	9.7	38.8	77.6	130	10	
2FDRL 098 784 S10	9.8	39.2	78.4	130	10	
2FDRL 099 792 S10	9.9	39.6	79.2	130	10	
2FDRL 100 800 S10	10	40	80	130	10	
2FDRL 101 808 S12	10.1	40.4	80.8	150	12	
2FDRL 102 816 S12	10.2	40.8	81.6	150	12	
2FDRL 103 824 S12	10.3	41.2	82.4	150	12	
2FDRL 104 832 S12	10.4	41.6	83.2	150	12	
2FDRL 105 840 S12	10.5	42	84	150	12	
2FDRL 106 848 S12	10.6	42.4	84.8	150	12	
2FDRL 107 856 S12	10.7	42.8	85.6	150	12	
2FDRL 108 864 S12	10.8	43.2	86.4	150	12	
2FDRL 109 872 S12	10.9	43.6	87.2	150	12	
2FDRL 110 880 S12	11	44	88	150	12	
2FDRL 111 888 S12	11.1	44.4	88.8	150	12	
2FDRL 112 896 S12	11.2	44.8	89.6	150	12	
2FDRL 113 904 S12	11.3	45.2	90.4	150	12	
2FDRL 114 912 S12	11.4	45.6	91.2	150	12	
2FDRL 115 920 S12	11.5	46	92	150	12	
2FDRL 116 928 S12	11.6	46.4	92.8	150	12	
2FDRL 117 936 S12	11.7	46.8	93.6	150	12	
2FDRL 118 944 S12	11.8	47.2	94.4	150	12	
2FDRL 119 952 S12	11.9	47.6	95.2	150	12	
2FDRL 120 960 S12	12	48	96	150	12	
2FDRL 125 1000 S14	12.5	50	100	180	14	
2FDRL 130 1040 S14	13	52	104	180	14	
2FDRL 135 1080 S14	13.5	54	108	180	14	
2FDRL 140 1120 S14	14	56	112	180	14	
2FDRL 145 1160 S16	14.5	58	116	200	16	
2FDRL 150 1200 S16	15	60	120	200	16	
2FDRL 155 1240 S16	15.5	62	124	200	16	
2FDRL 160 1280 S16	16	64	128	200	16	
2FDRL 165 1320 S18	16.5	66	132	220	18	
2FDRL 170 1360 S18	17	68	136	220	18	
2FDRL 175 1400 S18	17.5	70	140	220	18	
2FDRL 180 1440 S18	18	72	144	220	18	
2FDRL 185 1480 S20	18.5	74	148	250	20	
2FDRL 190 1520 S20	19	76	152	250	20	
2FDRL 195 1560 S20	19.5	78	156	250	20	
2FDRL 200 1600 S20	20	80	160	250	20	

2FDRW

2 Flutes, Multi-Processing Flat Drill with Oil Hole

초경 2날/ 다기능 플랫 드릴 (오일 홀)

New



- **HRC50이하, 프리하든강, 합금강, 주철, 알루미늄 가공용 플랫 드릴**
- 더블 마진 옆날과 절삭유 홀을 적용하여, 다양한 경사면과 곡면 드릴가공에 빠른 가공 속도를 실현합니다.
- 24~30도 헬릭스를 채택하여 칩배출 성능이 매우 우수합니다.
- 관통 드릴 작업시 버 발생을 최소화 합니다.
- TISIN-R 코팅으로 내열성과 내마모성이 우수, 긴 공구수명을 실현 하였습니다.

- **Flat drill for material below HRc 50, pre-hardened steel, alloy steel, cast iron and aluminum.**
- With double margin of side flute and coolant hole, high speed drilling is available to a variety of inclined and curved surfaces.
- Chip emission is great and stable drilling is available with between 24 to 30 degree helix design.
- Minimize burrs during penetration drilling.
- Increased tool life by applying TISIN-R coating with great heat and wear resistance.

2 | WC 미립자 | R TISIN-R | h7 Tolerence | 24°~30° Helix Angle | CUTTING DATA

381P

단위: mm

Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDRW 030 165 S04	3	13.5	16.5	60	4	
2FDRW 031 170 S04	3.1	14	17	60	4	
2FDRW 032 174 S04	3.2	14.4	17.4	60	4	
2FDRW 033 179 S04	3.3	14.9	17.9	60	4	
2FDRW 034 183 S04	3.4	15.3	18.3	60	4	
2FDRW 035 188 S04	3.5	15.8	18.8	60	4	
2FDRW 036 192 S04	3.6	16.2	19.2	60	4	
2FDRW 037 197 S04	3.7	16.7	19.7	60	4	
2FDRW 038 201 S04	3.8	17.1	20.1	60	4	
2FDRW 039 206 S04	3.9	17.6	20.6	60	4	
2FDRW 040 210 S06	4	18	21	60	6	
2FDRW 041 215 S06	4.1	18.5	21.5	70	6	
2FDRW 042 219 S06	4.2	18.9	21.9	70	6	
2FDRW 043 224 S06	4.3	19.4	22.4	70	6	
2FDRW 044 228 S06	4.4	19.8	22.8	70	6	
2FDRW 045 233 S06	4.5	20.3	23.3	70	6	
2FDRW 046 237 S06	4.6	20.7	23.7	70	6	
2FDRW 047 242 S06	4.7	21.2	24.2	70	6	
2FDRW 048 246 S06	4.8	21.6	24.6	70	6	
2FDRW 049 251 S06	4.9	22.1	25.1	70	6	
2FDRW 050 255 S06	5	22.5	25.5	70	6	
2FDRW 051 260 S06	5.1	23	26	70	6	
2FDRW 052 264 S06	5.2	23.4	26.4	70	6	
2FDRW 053 269 S06	5.3	23.9	26.9	70	6	
2FDRW 054 273 S06	5.4	24.3	27.3	70	6	
2FDRW 055 278 S06	5.5	24.8	27.8	70	6	
2FDRW 056 282 S06	5.6	25.2	28.2	70	6	
2FDRW 057 287 S06	5.7	25.7	28.7	70	6	
2FDRW 058 291 S06	5.8	26.1	29.1	70	6	
2FDRW 059 296 S06	5.9	26.6	29.6	70	6	
2FDRW 060 300 S06	6	27	30	70	6	
2FDRW 061 305 S08	6.1	27.5	30.5	80	8	
2FDRW 062 309 S08	6.2	27.9	30.9	80	8	
2FDRW 063 314 S08	6.3	28.4	31.4	80	8	
2FDRW 064 318 S08	6.4	28.8	31.8	80	8	
2FDRW 065 323 S08	6.5	29.3	32.3	80	8	
2FDRW 066 327 S08	6.6	29.7	32.7	80	8	
2FDRW 067 332 S08	6.7	30.2	33.2	80	8	
2FDRW 068 336 S08	6.8	30.6	33.6	80	8	
2FDRW 069 341 S08	6.9	31.1	34.1	80	8	
2FDRW 070 345 S08	7	31.5	34.5	80	8	
2FDRW 071 350 S08	7.1	32	35	80	8	
2FDRW 072 354 S08	7.2	32.4	35.4	80	8	
2FDRW 073 359 S08	7.3	32.9	35.9	80	8	
2FDRW 074 363 S08	7.4	33.3	36.3	80	8	
2FDRW 075 368 S08	7.5	33.8	36.8	80	8	
2FDRW 076 372 S08	7.6	34.2	37.2	80	8	
2FDRW 077 377 S08	7.7	34.7	37.7	80	8	
2FDRW 078 381 S08	7.8	35.1	38.1	80	8	
2FDRW 079 386 S08	7.9	35.6	38.6	80	8	

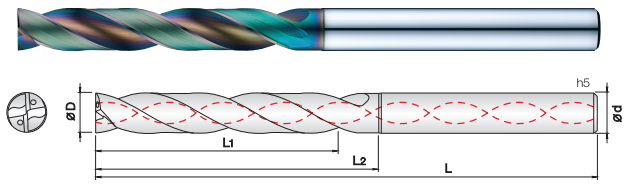
Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDRW 080 390 S08	8	36	39	80	8	
2FDRW 081 395 S10	8.1	36.5	39.5	90	10	
2FDRW 082 399 S10	8.2	36.9	39.9	90	10	
2FDRW 083 404 S10	8.3	37.4	40.4	90	10	
2FDRW 084 408 S10	8.4	37.8	40.8	90	10	
2FDRW 085 413 S10	8.5	38.3	41.3	90	10	
2FDRW 086 417 S10	8.6	38.7	41.7	90	10	
2FDRW 087 422 S10	8.7	39.2	42.2	90	10	
2FDRW 088 426 S10	8.8	39.6	42.6	90	10	
2FDRW 089 431 S10	8.9	40.1	43.1	90	10	
2FDRW 090 435 S10	9	40.5	43.5	90	10	
2FDRW 091 440 S10	9.1	41	44	90	10	
2FDRW 092 444 S10	9.2	41.4	44.4	90	10	
2FDRW 093 449 S10	9.3	41.9	44.9	90	10	
2FDRW 094 453 S10	9.4	42.3	45.3	90	10	
2FDRW 095 458 S10	9.5	42.8	45.8	90	10	
2FDRW 096 462 S10	9.6	43.2	46.2	90	10	
2FDRW 097 467 S10	9.7	43.7	46.7	90	10	
2FDRW 098 471 S10	9.8	44.1	47.1	90	10	
2FDRW 099 476 S10	9.9	44.6	47.6	90	10	
2FDRW 100 480 S10	10	45	48	90	10	
2FDRW 101 485 S12	10.1	45.5	48.5	100	12	
2FDRW 102 489 S12	10.2	45.9	48.9	100	12	
2FDRW 103 494 S12	10.3	46.4	49.4	100	12	
2FDRW 104 498 S12	10.4	46.8	49.8	100	12	
2FDRW 105 503 S12	10.5	47.3	50.3	100	12	
2FDRW 106 507 S12	10.6	47.7	50.7	100	12	
2FDRW 107 512 S12	10.7	48.2	51.2	100	12	
2FDRW 108 516 S12	10.8	48.6	51.6	100	12	
2FDRW 109 521 S12	10.9	49.1	52.1	100	12	
2FDRW 110 525 S12	11	49.5	52.5	100	12	
2FDRW 111 530 S12	11.1	50	53	110	12	
2FDRW 112 534 S12	11.2	50.4	53.4	110	12	
2FDRW 113 539 S12	11.3	50.9	53.9	110	12	
2FDRW 114 543 S12	11.4	51.3	54.3	110	12	
2FDRW 115 548 S12	11.5	51.8	54.8	110	12	
2FDRW 116 552 S12	11.6	52.2	55.2	110	12	
2FDRW 117 557 S12	11.7	52.7	55.7	110	12	
2FDRW 118 561 S12	11.8	53.1	56.1	110	12	
2FDRW 119 566 S12	11.9	53.6	56.6	110	12	
2FDRW 120 570 S12	12	54	57	110	12	
2FDRW 125 593 S14	12.5	56.3	59.3	120	14	
2FDRW 130 615 S14	13	58.5	61.5	120	14	
2FDRW 135 638 S14	13.5	60.8	63.8	120	14	
2FDRW 140 660 S14	14	63	66	120	14	
2FDRW 145 683 S16	14.5	65.3	68.3	130	16	
2FDRW 150 705 S16	15	67.5	70.5	130	16	
2FDRW 155 728 S16	15.5	69.8	72.8	130	16	
2FDRW 160 750 S16	16	72	75	130	16	

2FDRLW

2 Flutes, Long Length Multi-Processing Flat Drill with Oil Hole

초경 2날/긴 길이 다기능 플랫 드릴 (오일 홀)

New



- **HRC50이하, 프리하든강, 합금강, 주철, 알루미늄 가공용 플랫 드릴**
- 더블 마진 옆날과 절삭유 홀을 적용하여, 다양한 경사면과 곡면드릴가공에 빠른가공속도를실현합니다.
- 24~30도 헬릭스를채택하여칩배출성능이매우우수합니다.
- 관통드릴작업시버발생을최소화합니다.
- TISIN-R 코팅으로 내열성과 내마모성이 우수, 긴 공구 수명을 실현 하였습니다.

- **Flat drill for material below HRc 50, pre-hardened steel, alloy steel, cast iron and aluminum.**
- With double margin of side flute and coolant hole, high speed drilling is available to a variety of inclined and curved surfaces.
- Chip emission is great and stable drilling is available with between 24 to 30 degree helix design.
- Minimize burrs during penetration drilling.
- Increased tool life by applying TISIN-R coating with great heat and wear resistance.

2 | WC 미립자 | R TISIN-R | h7 Tolerence | 24°~30° Helix Angle | CUTTING DATA

381P

단위: mm

Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDRLW 030 231 S04	3	20.1	23.1	70	4	
2FDRLW 031 238 S04	3.1	20.8	23.8	70	4	
2FDRLW 032 244 S04	3.2	21.4	24.4	70	4	
2FDRLW 033 251 S04	3.3	22.1	25.1	70	4	
2FDRLW 034 258 S04	3.4	22.8	25.8	70	4	
2FDRLW 035 265 S04	3.5	23.5	26.5	70	4	
2FDRLW 036 271 S04	3.6	24.1	27.1	70	4	
2FDRLW 037 278 S04	3.7	24.8	27.8	70	4	
2FDRLW 038 285 S04	3.8	25.5	28.5	70	4	
2FDRLW 039 291 S04	3.9	26.1	29.1	70	4	
2FDRLW 040 298 S06	4	26.8	29.8	70	6	
2FDRLW 041 305 S06	4.1	27.5	30.5	85	6	
2FDRLW 042 311 S06	4.2	28.1	31.1	85	6	
2FDRLW 043 318 S06	4.3	28.8	31.8	85	6	
2FDRLW 044 325 S06	4.4	29.5	32.5	85	6	
2FDRLW 045 332 S06	4.5	30.2	33.2	85	6	
2FDRLW 046 338 S06	4.6	30.8	33.8	85	6	
2FDRLW 047 345 S06	4.7	31.5	34.5	85	6	
2FDRLW 048 352 S06	4.8	32.2	35.2	85	6	
2FDRLW 049 358 S06	4.9	32.8	35.8	85	6	
2FDRLW 050 365 S06	5	33.5	36.5	85	6	
2FDRLW 051 372 S06	5.1	34.2	37.2	85	6	
2FDRLW 052 378 S06	5.2	34.8	37.8	85	6	
2FDRLW 053 385 S06	5.3	35.5	38.5	85	6	
2FDRLW 054 392 S06	5.4	36.2	39.2	85	6	
2FDRLW 055 399 S06	5.5	36.9	39.9	85	6	
2FDRLW 056 405 S06	5.6	37.5	40.5	85	6	
2FDRLW 057 412 S06	5.7	38.2	41.2	85	6	
2FDRLW 058 419 S06	5.8	38.9	41.9	85	6	
2FDRLW 059 425 S06	5.9	39.5	42.5	85	6	
2FDRLW 060 432 S06	6	40.2	43.2	85	6	
2FDRLW 061 439 S08	6.1	40.9	43.9	100	8	
2FDRLW 062 445 S08	6.2	41.5	44.5	100	8	
2FDRLW 063 452 S08	6.3	42.2	45.2	100	8	
2FDRLW 064 459 S08	6.4	42.9	45.9	100	8	
2FDRLW 065 466 S08	6.5	43.6	46.6	100	8	
2FDRLW 066 472 S08	6.6	44.2	47.2	100	8	
2FDRLW 067 479 S08	6.7	44.9	47.9	100	8	
2FDRLW 068 486 S08	6.8	45.6	48.6	100	8	
2FDRLW 069 492 S08	6.9	46.2	49.2	100	8	
2FDRLW 070 499 S08	7	46.9	49.9	100	8	
2FDRLW 071 506 S08	7.1	47.6	50.6	100	8	
2FDRLW 072 512 S08	7.2	48.2	51.2	100	8	
2FDRLW 073 519 S08	7.3	48.9	51.9	100	8	
2FDRLW 074 526 S08	7.4	49.6	52.6	100	8	
2FDRLW 075 533 S08	7.5	50.3	53.3	100	8	
2FDRLW 076 539 S08	7.6	50.9	53.9	100	8	
2FDRLW 077 546 S08	7.7	51.6	54.6	100	8	
2FDRLW 078 553 S08	7.8	52.3	55.3	100	8	
2FDRLW 079 559 S08	7.9	52.9	55.9	100	8	

Order Number	날경 Diameter D	홈길이 Flute Length L1	유효장 Effective Length L2	전장 Overall Length L	생크 Shank Dia d	비고
2FDRLW 080 566 S08	8	53.6	56.6	100	8	
2FDRLW 081 573 S10	8.1	54.3	57.3	110	10	
2FDRLW 082 579 S10	8.2	54.9	57.9	110	10	
2FDRLW 083 586 S10	8.3	55.6	58.6	110	10	
2FDRLW 084 593 S10	8.4	56.3	59.3	110	10	
2FDRLW 085 600 S10	8.5	57	60	110	10	
2FDRLW 086 606 S10	8.6	57.6	60.6	110	10	
2FDRLW 087 613 S10	8.7	58.3	61.3	110	10	
2FDRLW 088 620 S10	8.8	59	62	110	10	
2FDRLW 089 626 S10	8.9	59.6	62.6	110	10	
2FDRLW 090 633 S10	9	60.3	63.3	110	10	
2FDRLW 091 640 S10	9.1	61	64	110	10	
2FDRLW 092 646 S10	9.2	61.6	64.6	110	10	
2FDRLW 093 653 S10	9.3	62.3	65.3	110	10	
2FDRLW 094 660 S10	9.4	63	66	110	10	
2FDRLW 095 667 S10	9.5	63.7	66.7	110	10	
2FDRLW 096 673 S10	9.6	64.3	67.3	110	10	
2FDRLW 097 680 S10	9.7	65	68	110	10	
2FDRLW 098 687 S10	9.8	65.7	68.7	110	10	
2FDRLW 099 693 S10	9.9	66.3	69.3	110	10	
2FDRLW 100 700 S10	10	67	70	110	10	
2FDRLW 101 707 S12	10.1	67.7	70.7	125	12	
2FDRLW 102 713 S12	10.2	68.3	71.3	125	12	
2FDRLW 103 720 S12	10.3	69	72	125	12	
2FDRLW 104 727 S12	10.4	69.7	72.7	125	12	
2FDRLW 105 734 S12	10.5	70.4	73.4	125	12	
2FDRLW 106 740 S12	10.6	71	74	125	12	
2FDRLW 107 747 S12	10.7	71.7	74.7	125	12	
2FDRLW 108 754 S12	10.8	72.4	75.4	125	12	
2FDRLW 109 760 S12	10.9	73	76	125	12	
2FDRLW 110 767 S12	11	73.7	76.7	125	12	
2FDRLW 111 774 S12	11.1	74.4	77.4	135	12	
2FDRLW 112 780 S12	11.2	75	78	135	12	
2FDRLW 113 787 S12	11.3	75.7	78.7	135	12	
2FDRLW 114 794 S12	11.4	76.4	79.4	135	12	
2FDRLW 115 801 S12	11.5	77.1	80.1	135	12	
2FDRLW 116 807 S12	11.6	77.7	80.7	135	12	
2FDRLW 117 814 S12	11.7	78.4	81.4	135	12	
2FDRLW 118 821 S12	11.8	79.1	82.1	135	12	
2FDRLW 119 827 S12	11.9	79.7	82.7	135	12	
2FDRLW 120 834 S12	12	80.4	83.4	135	12	
2FDRLW 125 868 S14	12.5	83.8	86.8	140	14	
2FDRLW 130 901 S14	13	87.1	90.1	140	14	
2FDRLW 135 935 S14	13.5	90.5	93.5	140	14	
2FDRLW 140 968 S14	14	93.8	96.8	140	14	
2FDRLW 145 1002 S16	14.5	97.2	100.2	160	16	
2FDRLW 150 1035 S16	15	100.5	103.5	160	16	
2FDRLW 155 1069 S16	15.5	103.9	106.9	160	16	
2FDRLW 160 1102 S16	16	107.2	110.2	160	16	

PCD End Mill Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	VC m/mim	FEED RATE (fz)			
		2 ~ 3mm	4 ~ 6mm	7 ~ 11mm	12 ~ 20mm
AL-alloy Si 〈1%	150 ~ 6,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
AL-alloy Si 〈12%	150 ~ 4,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
AL-alloy Si 〉12%	150 ~ 2,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Magnesium alloy	150 ~ 6,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Cooper alloy	150 ~ 5,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Brass ally	150 ~ 5,001	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
GFRP	150 ~ 3,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
CFRP	150 ~ 4,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3
Graphite	150 ~ 3,000	0.007 ~ 0.05	0.02 ~ 0.150	0.02 ~ 0.20	0.04 ~ 0.3

2SPO Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	구조용강/ 탄소강/ 회주철 SS / SC / FC		합금강/ 프리하든강 SCM / NAK / HPM		금형강/ 열처리강 SKD	
경도 Hardness	~ 200 HB		20~ 30HRC		30~ 40HRC	
외경 Outside Diameter	절삭속도 (V/C)	이송량 (f)	절삭속도 (V/C)	이송량 (f)	절삭속도 (V/C)	이송량 (f)
ø 1	23,800	500	2,000	400	19.100	380
ø 2	12,000	700	10,350	400	9.550	380
ø 3	8,000	800	6,900	550	6.400	510
ø 4	5,900	800	5,200	620	4.800	570
ø 6	3,980	700	3,450	550	3.180	510
ø 8	3,000	600	2,600	520	2.400	480
ø 10	2,400	580	2,070	500	2.000	460
ø 12	2,000	560	1,720	480	1.600	450
ø 16	1,500	500	1,300	400	1.200	380

2STD Cutting Condition

• RPM : min^{-1} • Feed : mm/min

피삭재 Material	구조용강/탄소강 /회주철 SS / SC / FC ~200HB		합금강 /프리하든강 SCM / NAK / HPM 20 ~30HRC		금형강/열처리강 SKD 30 ~ 40HRC		덕타일 주철 FCD		스텐레스강 SUS304		알루미늄 합금 A7075		인코넬 inconel	
직경 Diameter	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f	절삭속도 V/C	이송량 f
ø 3.4	60 ~100	0.1 ~ 0.2	60 ~100	0.1 ~ 0.2	20 ~ 60	0.05 ~ 0.1	40 ~ 70	0.07 ~ 0.2	20 ~ 60	0.05 ~ 0.2	80 ~ 120	0.1 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 4.3	60 ~100	0.1 ~ 0.2	60 ~100	0.1 ~ 0.2	20 ~ 60	0.05 ~ 0.1	40 ~ 70	0.07 ~ 0.2	20 ~ 60	0.05 ~ 0.2	80 ~ 120	0.1 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 5.1	60 ~100	0.1 ~ 0.2	60 ~100	0.1 ~ 0.2	20 ~ 60	0.05 ~ 0.1	40 ~ 70	0.07 ~ 0.2	20 ~ 60	0.05 ~ 0.2	80 ~ 120	0.1 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 6.9	60 ~100	0.15 ~ 0.3	60 ~100	0.15 ~ 0.3	20 ~ 60	0.08 ~ 0.2	40 ~ 70	0.1 ~ 0.2	20 ~ 60	0.1 ~ 0.2	80 ~ 120	0.15 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 8.6	60 ~100	0.15 ~ 0.3	60 ~100	0.15 ~ 0.3	20 ~ 60	0.08 ~ 0.2	40 ~ 70	0.1 ~ 0.2	20 ~ 60	0.1 ~ 0.2	80 ~ 120	0.15 ~ 0.2	10 ~ 30	0.05 ~ 0.15
ø 10.3	60 ~100	0.2 ~ 0.4	60 ~100	0.2 ~ 0.4	20 ~ 60	0.1 ~ 0.2	40 ~ 70	0.2 ~ 0.4	20 ~ 60	0.15 ~ 0.3	80 ~ 120	0.2 ~ 0.4	10 ~ 30	0.1 ~ 0.2

2DED Cutting Condition

• RPM : rev./min • Feed : mm/min

피삭재 Material	알루미늄 합금 Aluminum Alloys		수지 Resin	
직경 Diameter	RPM	이송량 (f)	RPM	이송량 (f)
ø 0.1 ~ 0.3	25,000	0.001 ~ 0.003	22,000	0.001 ~ 0.003
ø 0.3 ~ 0.5	20,000	0.005 ~ 0.02	22,000	0.005 ~ 0.01
ø 0.5 ~ 0.8	18,000	0.01 ~ 0.03	15,000	0.01 ~ 0.03
ø 0.8 ~ 1	15,000	0.02 ~ 0.04	13,000	0.02 ~ 0.05
ø 1~1.5	12,000	0.03 ~ 0.05	8,000	0.02 ~ 0.05
ø 1.5 ~ 2	9,000	0.03 ~ 0.05	6,000	0.02 ~ 0.05
ø 2 ~ 3	7,000	0.03 ~ 0.05	4,500	0.05
ø 3 ~ 4	3,500	0.03 ~ 0.05	3,200	0.05
ø 4 ~ 5	2,800	0.03 ~ 0.05	2,500	0.05
ø 5 ~ 6	2,200	0.03 ~ 0.05	2,000	0.05

- 진동이 적고 강성이 좋은 공작기계 사용요망합니다 (Ø1 이하 사용시 진동 허용 관리 3㎛이내 일것.)
- 가급적 열박음 척을 추천합니다.
- 상기 절삭조건은 참고 수치이므로, 실 가공시 가공 형상, 가공 목적, 적용 기계에 따라 조건변경 요망 합니다.
- 조건표가 기계의 최대 스핀들 속도를 초과하거나 버 및 적열 현상이 발생할때 스핀들 속도와 이송 속도를 비례적으로 조정 하십시오.

- Use a machine with low vibration and good rigidity (Ø1 or less, the vibration tolerance management should be within 3㎛).
- Using shrink-fit chuck is recommeded.
- Use this table for your reference. Adjust the parameters depending on your machining geometry, machining purpose and CNC.
- If the table over the maximum RPM and feed of your machine, or found red heat on the material, adjust RPM and feed in the same proportion.

2FDR Cutting Condition

• RPM : min^{-1} • Feed : mm/min

피삭재 Material	구조용강/탄소강/회주철 SS / SC / FC ~200HB		합금강/프리하든강 SCM / NAK / HPM 20 ~30HRC		금형강/열처리강 SKD 30 ~ 40HRC		고경도강 Hardened steels 40 ~ 50HRC		덕타일주철 FCD		스텐레스강 SUS304		알루미늄합금 A7075		알루미늄합금주물 AC / ADC	
직경 Diameter	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송속도 FEED
ø 0.2	33000	35	29500	40	16500	25	14000	15	29500	30	16200	15	59500	130	55000	110
ø 0.3	31500	55	25000	40	15500	30	12500	15	26500	35	15300	15	59000	200	52500	120
ø 0.4	27500	75	23800	50	14500	35	11500	20	23200	40	14500	20	58500	230	50000	165
ø 0.5	25800	85	22000	60	13200	40	11000	25	21500	45	13200	20	58300	280	48500	190
ø 0.6	24600	115	20500	85	12000	55	10000	25	20000	60	12000	25	55000	320	45000	230
ø 0.7	22500	135	19500	115	11000	70	9000	30	18500	90	11500	30	51000	400	41000	280
ø 0.8	21000	180	18000	150	10500	80	8000	35	17000	120	10000	35	46000	500	35000	330
ø 0.9	20500	240	16800	190	9500	95	7500	35	16000	145	9850	40	43000	630	31500	380
ø 1	19500	300	16000	230	9450	110	6800	35	15700	180	9600	50	40000	710	27500	430
ø 2	12000	340	10000	290	5800	150	4100	60	10000	230	-	-	24500	750	18000	510
ø 3	8000	410	7100	330	3800	165	2700	70	7100	280	-	-	18000	950	13000	650
ø 4	6100	425	5200	380	2700	170	2100	80	5250	300	-	-	13000	1000	10000	680
ø 5	4900	425	4200	280	2350	175	1650	80	4250	300	-	-	10000	1000	7800	680
ø 6	4150	425	3550	330	1800	175	1350	80	3550	300	-	-	8600	1000	6500	680
ø 8	3100	430	2700	350	1500	175	1000	80	2700	300	-	-	6500	1000	4850	680
ø 10	2600	430	2200	360	1100	175	850	80	2000	300	-	-	5200	1000	3850	680
ø 12	2100	430	1750	360	950	175	630	80	1800	310	-	-	4300	1000	3300	680
ø 18	1600	430	1400	360	750	175	520	80	1350	310	-	-	3300	1000	2550	680
ø 20	1250	430	1100	360	600	175	430	80	1000	310	-	-	2600	1000	2000	680

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을시, 회전과 속도를 20% 줄여 사용하십시오.
- 드릴링의 깊이가 직경의 2배나 그 이하일때, 드릴링을 직경의 2배 이상 가공하는 것을 추천하지 않습니다.
- 스테인레스 드릴링 시(SUS304, 316 등등) 직경 1.9mm나 그 이하 직경을 사용하십시오.
- 경사 드릴 가공시, 경사진 각도에 따라(절삭 조건을) 조절하십시오. 경사각이 30도 이하일 때, 피드를 50% 낮추십시오.
  경사각이 30도 이상일 때, 회전을 70% 이하, 피드를30% 이하로 줄이십시오.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Drilling for the depth of 2 x Dc or Less than 2 x Dc is recommended.
- For stainless drilling, we recommend that the tool diameter is 1.9mm or less.
- If you use for inclined angle as slope drilling, reduce the feed by 50% for inclined angle less than 30°, and reduce below 70% of the RPM and 30% of the feed for inclined angle over 30°.
- Do not use for side milling.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

2FDRL Cutting Condition

• RPM : min^{-1} • Feed : mm/min

피삭재 Material	구조용강/탄소강 /회주철 SS / SC / FC ~200HB		합금강 /프리하든강 SCM / NAK / HPM 20 ~30HRC		금형강/프리하든강 SKD 30 ~ 40HRC		고경도강 Hardened steels 40 ~ 50HRC		덕타일 주철 FCD		알루미늄 합금 A7075	
직경 Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø 3	11000	800	9500	580	7500	320	5000	220	9300	400	13000	1000
ø 4	8000	800	7200	580	5600	320	4100	220	7300	400	10000	1000
ø 5	6500	800	5550	580	4500	320	3300	220	6000	400	7800	1000
ø 6	5500	810	4800	590	3550	320	2700	220	5000	400	6600	1000
ø 8	4100	810	3600	590	2850	320	2000	220	3800	400	4650	1050
ø 10	3300	810	3000	590	2350	320	1650	220	3000	410	3900	1050
ø 12	2750	820	2450	600	2000	320	1480	220	2480	410	3250	1050
ø 16	2100	820	1800	600	1550	330	1000	220	1850	410	2450	1100
ø 20	1650	820	1550	600	1250	330	850	220	1550	410	2000	1100

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 이송속도를 20% 줄여 사용하십시오.
- 드릴링 깊이가 직경의 2배 이하가 되게 절삭조건표를 사용하십시오.
- 스테인레스 소재에는 사용하지 마십시오. 스테인레스 소재에는 2FDRW 혹은 2FDRLW 사용을 추천합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Use the cutting parameters for the depth of 2 x Dc or less.
- Do not use for stainless material. We recommend using 2FDRW or 2FDRLW for stainless material.
- Do not use for side milling.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

2FDRW(3D) Cutting Condition

• RPM : min^{-1} • Feed : mm/min

피삭재 Material	구조용강/탄소강 /회주철 SS / SC / FC ~200HB		합금강 /프리하든강 SCM / NAK / HPM 20 ~30HRC		금형강/열처리강 SKD 30 ~ 40HRC		고경도강 Hardened steels 40 ~ 50HRC		덕타일 주철 FCD		스텐레스강 SUS304		알루미늄 합금 A7075	
직경 Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø 1	16000	120	13000	70	9500	40	8000	40	13000	50	1000	20	22500	200
ø 1.5	10000	130	8500	80	6500	40	5300	40	9000	50	6500	20	15000	200
ø 2	9500	150	8000	95	5500	50	4800	50	8000	70	6500	35	13000	230
ø 2.5	12000	450	9500	300	9600	200	5800	120	9500	220	8800	210	13000	650
ø 3	12500	900	10000	600	7500	300	6500	270	10000	450	10000	600	14500	1200
ø 4	9500	930	8000	620	5500	300	4800	270	8000	450	8000	600	12000	1200
ø 5	7500	930	6500	620	4500	300	3800	270	6300	460	6300	620	9000	1200
ø 6	6500	950	5400	630	3700	330	3200	280	5400	470	5500	620	7500	1300
ø 8	4800	950	4000	630	2900	330	2500	280	4000	470	4000	620	5600	1300
ø 10	3800	950	3300	630	2450	330	2000	280	3200	470	3300	620	4500	1300
ø 12	3300	950	2800	630	2000	330	1600	280	2800	470	2900	620	3900	1300
ø 16	2500	950	2000	630	1500	330	1300	280	2000	470	2000	620	2800	1300

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 속도를 20% 줄여 사용하십시오.
- 드릴 깊이는 3xDc를 넘기지 마십시오. 칩 배출 상태가 좋지 않을 경우, 펙드릴링 방식을 사용하십시오.
- 스테인레스 소재에는 펙드릴 방식을 사용하십시오.
- 펙드릴 간격은 0.1Dc ~ 0.5Dc 사이를 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Do not over the drilling depth of 3 x Dc. If the state of chip emission is not good enough, use peck drilling method.
- For the stainless material, use peck drilling method.
- Peck drill interval is recommended between 0.1 Dc to 0.5 Dc.
- Side milling is not possible.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

2FDRLW(5D) Cutting Condition

• RPM : min^{-1} • Feed : mm/min

피삭재 Material	구조용강/탄소강 /회주철 SS / SC / FC ~200HB		합금강 /프리하든강 SCM / NAK / HPM 20 ~30HRC		금형강/열처리강 SKD 30 ~ 40HRC		고경도강 Hardened steels 40 ~ 50HRC		덕타일 주철 FCD		스텐레스강 SUS304		알루미늄 합금 A7075	
직경 Diameter	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED	회전수 RPM	이송 속도 FEED
ø 1	19000	200	16000	100	10000	50	10000	45	15000	75	13000	60	25000	230
ø 1.5	13000	200	10000	100	7600	50	6500	45	10000	75	8500	60	17000	230
ø 2	10000	300	9500	200	6800	95	5600	70	9500	120	8000	100	14500	400
ø 2.5	13000	700	10000	350	7000	180	5800	150	10000	250	9500	300	15500	850
ø 3	15000	1250	10000	600	7300	300	6500	270	10000	460	10000	600	17000	1350
ø 4	11000	1300	8000	600	5500	300	4800	270	8000	460	8000	620	14000	1400
ø 5	9000	1300	6400	600	4500	300	3800	270	6500	460	6500	620	10000	1400
ø 6	7500	1350	5300	630	3700	320	3200	280	5300	480	5300	630	9500	1500
ø 8	5600	1350	4000	630	2800	320	2500	280	4000	480	4000	630	6500	1500
ø 10	4500	1350	3200	630	2300	320	2000	280	3200	480	3300	630	5100	1600
ø 12	3700	1350	2800	630	2000	320	1700	280	2900	480	2800	630	4300	1600
ø 16	2850	1350	2100	630	1500	320	1300	280	2100	480	2100	630	3300	1600

- 절삭 조건표 참조는 수용성 절삭유 사용이 전제입니다. 절삭유를 사용하지 않을 시, 회전과 속도를 20% 줄여 사용하십시오.
- 드릴 깊이는 5xDc를 넘기지 마십시오. 칩 배출 상태가 좋지 않을 경우, 펙드릴링 방식을 사용하십시오.
- 스테인레스 소재에는 펙드릴 방식을 사용하십시오.
- 펙드릴 간격은 0.1Dc ~ 0.5Dc 사이를 권장합니다.
- 측면 가공용으로는 사용하지 마십시오.
- 절삭 조건을 기계 강성이나 클램프 상태에 따라 조절하십시오.

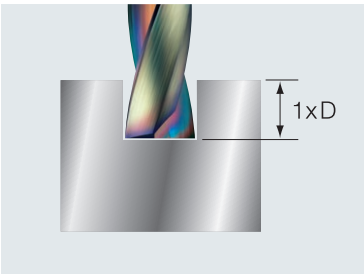
- Use the water soluble cutting oil. In case if you do not use water soluble cutting oil, reduce the RPM and the feed by 20%.
- Do not over the drilling depth of 5 x Dc. If the state of chip emission is not good enough, use peck drilling method.
- For the stainless material, use peck drilling method.
- Peck drill interval is recommended between 0.1 Dc to 0.5 Dc.
- Side milling is not possible.
- Change cutting conditions depending on work variables; rigidity of machine, work clamp or material shape.

플랫드릴 유의사항 Note for flat drill

평면과 경사진 면을 하나의 드릴로 ! Flat and inclined surface drilling with one tool !

3xD 깊이 이상의 홀 가공을 위해서는 기초 가이드홀 드릴링 작업을 권장합니다.

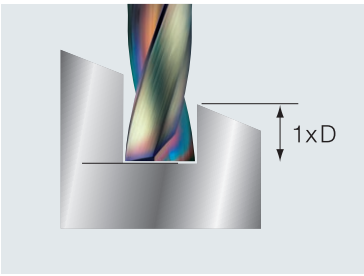
Guide hole drilling is recommended for hole over 3D depth.



평면 홀 가공 Flat surface hole drilling

평면 홀 가공 Drilling for flat surface

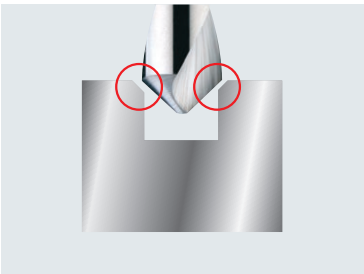
- 3D 이상 : 드릴의 직경 만큼의 가이드 홀 깊이 가공을 권장하며, pitch 값을 여러번 나눠하는 펙드릴(G83)을 추천합니다.
- 3D 이하 : 절삭력이 우수하여, 낮은 깊이의 홀에는 칩브레이크 방식(G73)으로 가공 시간을 단축할 수 있습니다.
- 스테인레스 소재의 기초 홀 가공시에는 2FDRW 제품을 권장합니다.
- Over 3D : Peak drilling cycle (G83) is recommended to divide short pitch values several times to drill down to the same length as the tool diameter.
- Under 3D : In the case of small diameter, the chip break drilling cycle (G73) has excellent cutting power, which reduce processing time.
- For the stainless material, guild hole drilling is recommended with 2FDRW.



경사면 홀 가공
Inclined surface hole drilling

경사면 홀 가공 Drilling for inclined surface

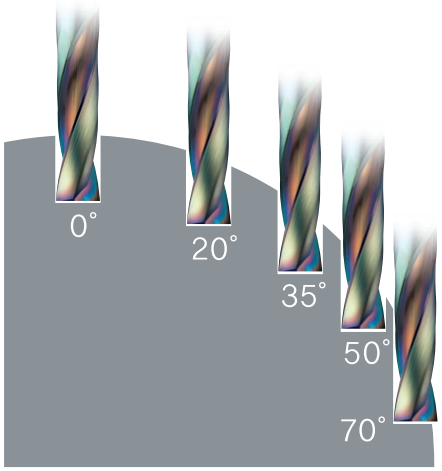
- 3D 이상 가공할 경우에는, 드릴의 직경 만큼의 가이드 홀 깊이 가공을 권장합니다. (ex. ø10, ae=10)
- 경사면 드릴링에 CEN 제품 사용이 불가능하여, 2FDR을 권장합니다.
- 스테인레스 소재의 기초 홀 가공시에는 2FDRW 제품을 권장합니다.
- 경사진 면의 가공시에는 피드속도를 줄여주십시오.
- Guide hole drilling is recommended when the depth of drilling is over 3D. (ex. ø10, ae=10)
- For drilling to the inclined surface, drilling with CEN is not possible. 2FDR is recommended.
- In case drilling to a stainless material, guild hole drilling is recommended with 2FDRW.
- For drilling to the inclined surface, reduce feed.



챔퍼링 Chamfering

챔퍼링 Chamfering

- 채퍼링시에는 드릴 직경보다 큰 직경의 CEN 제품으로 면취 작업을 추천하며, 챔퍼링 뒤에 드릴링을 진행하면 표면처리에 좋습니다. (카탈로그 CEN 품목 참조)
- The surface treatment is great with drilling after the chamfering, and using a larger diameter of the CEN tool than hole diameter is recommended. (Refer to CEN series on the main catalog)



곡면 드릴링을 위한 추천 절삭조건

Recommended cutting condition on slope drilling

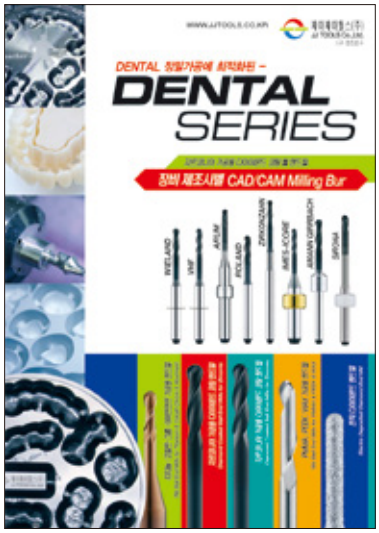
위치 Position	절삭 속도 Cutting Speed			이송 속도 Feed		
각도 Angle	Vc(m/min)	회전수 RPM	비율 Rate	날당 이송량 fz	이송 속도 (mm/min)	비율 Rate
0°	82	2600	100%	0.08	430	100%
20°	82	2600	100%	0.04	209	50%
35°	55	1752	70%	0.03	112	40%
50°	55	1752	70%	0.02	84	30%
70°	55	1752	70%	0.015	53	20%

S45C 직경 10mm 기준 Cutting condition criteria of 10mm for S45C material.

Your specials are our standards.

당신의스페셜은우리의표준품입니다.

WWW.JJTOOLS.CO.KR



제이제이툴스(주)
JJ TOOLS Co.,Ltd.
31, Dusan-ro, Geumcheon-gu, Seoul,
Republic of Korea Tel. +82.2.808.2745
Fax. +82.2.808.2746 www.jjtools.co.kr

ISO 9001 ISO 14001

제이제이툴스의 전제품은 세계적인 품질·환경 규격인
ISO 품질·환경 경영시스템 인증을 획득하였습니다.